

Introduction

The Atlantic sea scallop, Placopecten magellanicus (Gmelin), is an epibenthic bivalve mollusk distributed in western North Atlantic continental shelf waters from the Northern Gulf of St. Lawrence to Cape Hatteras, North Carolina (Posgay 1957; Serchuk et al. 1979). Throughout their range, sea scallops support significant commercial fisheries. Currently, the USA commercial fishery is one of the most economically important fisheries along the eastern coast of the United States. During 1977-1981, USA sea scallop landings averaged 12,800 tons¹ annually, an all-time high. In 1980, domestic scallop landings generated a record 110.4 million dollars in ex-vessel revenue (United States Department of Commerce 1981).

Principal USA sea scallop resources are located on Georges Bank, in the Middle Atlantic, and in the Gulf of Maine (NAFO Subdivision 5Ze, Statistical Area 6, and Division 5Y, respectively: Figure 1). Apart from shallow water populations occurring in estuaries and embayments along the Maine coast (Dow 1969), most of the sea scallop resources under USA fisheries jurisdiction are found further offshore, primarily at depths between 40 and 100 m, in waters cooler than 20°C.

No biological evidence presently exists indicating a discrete differentiation of stocks between any of the USA offshore sea scallop populations. Although the major offshore scallop grounds tend to be geographically isolated, sea scallop eggs and larvae are planktonic and can be transported long distances during their pelagic phase. Posgay (1979) has postulated, based on sea surface current patterns and a 35-day larval period, that spatfall of scallops southwest of Georges Bank may result from progeny spawned from parental beds located to the

¹Tons in this paper refer to metric tons, meat weight.

northeast. Exchange of scallop larvae between the Gulf of Maine and Georges Bank may also occur due to drift of Gulf of Maine surface water across Georges Bank in the autumn (Bumpus 1976). Since sea scallop larvae have only recently been positively identified in plankton collections (Savage 1980), more definitive evaluation of the inter-mixture of reproductive products between scallop populations cannot presently be tendered.

Formalized management of the offshore sea scallop fisheries was initially attempted under the International Commission for the Northwest Atlantic Fisheries (ICNAF) in 1972, when ICNAF accepted a proposal prohibiting the retention and landing of scallops from Division 5Z (Georges Bank) which were less than 95 mm shell height and resulted in an average meat count of more than 40 scallop meats per pound. However, both Canada and the USA, the sole participants in the fishery, did not adopt these measures until 1976, when an allowance of 10% was provided for both the number of scallops below the size limit and above the average meat count. Subsequently, regulation of the offshore scallop fisheries by both nations has differed. Canada has implemented management measures that include limited entry, vessel trip catch limits, and continuation of meat count controls (Caddy and Jamieson 1977). Apart from the limitation on entry into the Canadian fleet, however, these management measures have not really been restrictive (see Serchuk et al. 1979, p. 185). Through 1981, the USA had not imposed any regulations within its scallop fisheries although in some USA ports union and industry practices have long controlled trip duration, vessel crew size, and shore-side layover time (Royce 1946; Doherty et al. 1964). A Fishery Management Plan for Atlantic Sea Scallops has been developed, however, for managing USA sea scallop resources (New England Fishery Management Council 1982) which includes meat count and minimum shell size restrictions as management measures. This Plan was implemented on an emergency basis on May 15, 1982, to address the immediate need to protect incoming recruitment of small scallops in the Georges Bank fishery during spring-summer 1982.

This report presents an analysis of the status of sea scallop populations in the Georges Bank, Middle Atlantic, and Gulf of Maine offshore regions of the United States. Data presented include commercial (USA and Canada) landings and effort statistics, commercial catch compositions, commercial abundance indices (catch per effort), and research vessel survey size composition and relative abundance indices. Analyses are also provided on sea scallop shell height-meat weight relationships, shell height and meat weight-ovary weight relationships, and yield per recruit. The present document is both an update and amplification of previous assessments and includes some revised data to those reported in Serchuk et al (1979). Evaluations of current resource conditions are presented and interpreted with respect to recent and historical fishing patterns and practices, recruitment prospects, and trends in population abundance levels.

Commercial Fishery

Historical Fishery (1887-1974)

Commercial landings of sea scallops from USA Northwest Atlantic waters have been recorded since 1887 (Lyles 1969; Table 1). Until the development of the Georges Bank fishery during the 1930's, commercial landings never exceeded 1,000 tons, averaging 304 tons per year from 1887-1928. During the earliest years of the USA fishery, most of the landings were harvested from the territorial waters of the State of Maine (until the 1920's) after which scallop beds off of Long Island and in the Mid-Atlantic sustained the majority of the USA catch. Between 1926 and 1935, 58% of the USA scallop landings were derived from Mid-Atlantic populations (Lyles 1969)

By 1937, Georges Bank sea scallop landings accounted for more than half of the total USA scallop catch (Premetz and Snow 1953). For the next 29 years, the Georges Bank resource was the mainstay of the domestic commercial fishery providing